Econ 311: Behavioral and Experimental Economics

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Introduction to Social Preferences

Motivation

- The standard model typically assumes that only one's own payoff/consumption enters one's utility function
- Yet the observational evidence otherwise is massive:
  - Charitable giving: over $300 billion annually by more than 100 million individuals
  - Volunteering: nearly 8 billion hours annually by more than 60 million individuals
  - SNAP program: benefits totaling over $70 billion distributed to 45 million people in US
  - All statistics annual averages for USA

Social Preferences

- If the outcomes or beliefs of others affect an agents' utility in any way, we say that agent has *social preferences*
- We have two kinds of social preferences:
  - *Distributional preferences*: the agent cares only about the final outcome, ie who has what
  - *Reciprocal preferences*: the agent cares additionally about the path we took to arrive at an outcome
    - The same outcome can feel good or bad depending on context and reference points

Formalizing Social Preferences

- Assume there are 2 agents in the economy
- Agent i gets consumption x_i
- Preferences of agent 1 represented by utility $U_1(x_1, x_2)$
- Assume that budget constraint is $p_1 x_1 + p_2 x_2 = m$
- What does budget constraint look like?
  - Straight line, downward sloping
  - If x_1 on horizontal axis, slope is $-\frac{p_1}{p_2}$

Altruism vs Envy

- *Altruism*: agent 1's utility increases in agent 2's payoffs
  - Pure altruism: does not matter who transferred money to agent 2
  - Impure altruism: if someone else transfers money to 2, this does not make 1 better off
- *Envy*: agent 1's utility decreases in agent 2's payoff
- *Selfish*: agent 1's utility does not depend on agent 2's payoff

Selfish Preferences

- Utility function: $U(x_1, x_2) = x_1$
- What do indifference curves look like?
  - Straight vertical lines
  - Note that giving more payoff to player 2 has not effect on utilty
- What is optimal allocation from agent 1's perspective
  - $x_1 = \frac{m}{p_1}$ and $x_2 = 0$
  - Spend all resources on own payoff

Rawlsian Preferences

- Utility function: $U(x_1, x_2) = \min\{x_1, x_2\}$
- What do indifference curves look like?
  - Right angles
  - Note that increasin payoff of "richer" agent cannot make agent 1 better off
- What is optimal allocation from agent 1's perspective?
  - $x_1 = x_2$, ie even split of resources
- Sometimes say that this type of agent demonstrates pure *inequality averse* preferences

Utilitarian Preferences

- Utility function: $U(x_1, x_2) = x_1 + x_2$
- That is, agent 1's utility is proportional to the sum of payoffs
- What do indifference curves look like?
  - Straight lines
  - Increased payoff to *either* agent makes player 1 equally more well off
- What is optimal allocation from agent 1's perspective?
  - Optimum allocation will be corner solution
  - Agent 1 will prefer to allocate all payoffs to whichever of x_1 and x_2 is cheaper
- Sometimes say that this type of agent demonstrates pure *social welfare* preferences

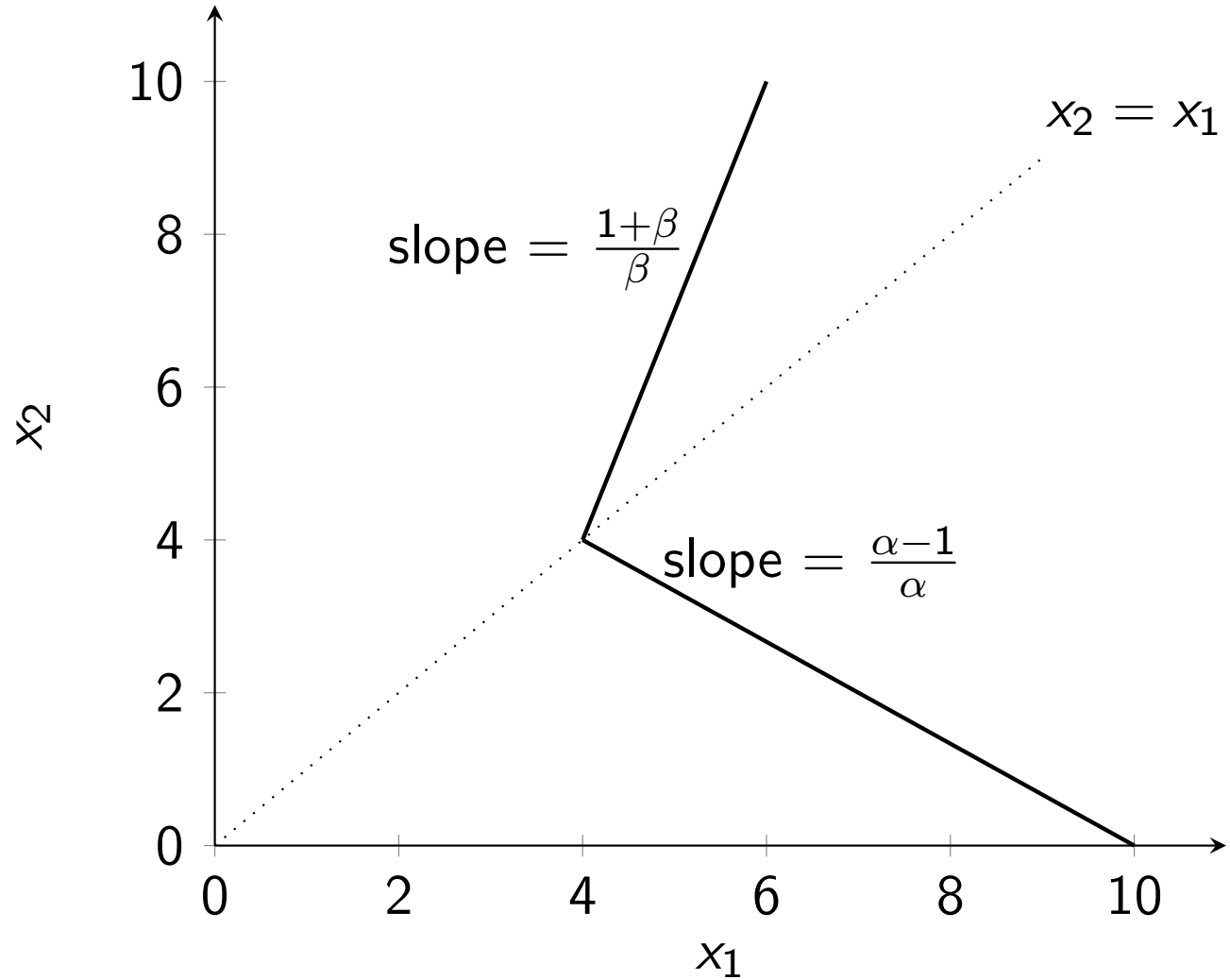
Fehr-Schmidt Difference-Aversion Preferences

- In general it is possible for someone to care both about inequality and about total welfare
- We have several different ways of writing this down
- One possibility: difference aversion preferences from Fehr and Schmidt (1999)

$$U(x_1, x_2) = \begin{cases} x_1 - \alpha(x_1 - x_2) & \text{if } x_1 > x_2 \\ x_1 - \beta(x_2 - x_1) & \text{if } x_1 \leq x_2 \end{cases}$$

  where $0 \leq \alpha \leq \beta \leq 1$
- Interpretation:
  - Agent 1 dislikes inequality
  - But she dislikes it *more* when she is the one who has the smaller allocation

Indifference Curves for Fehr-Schmidt Model

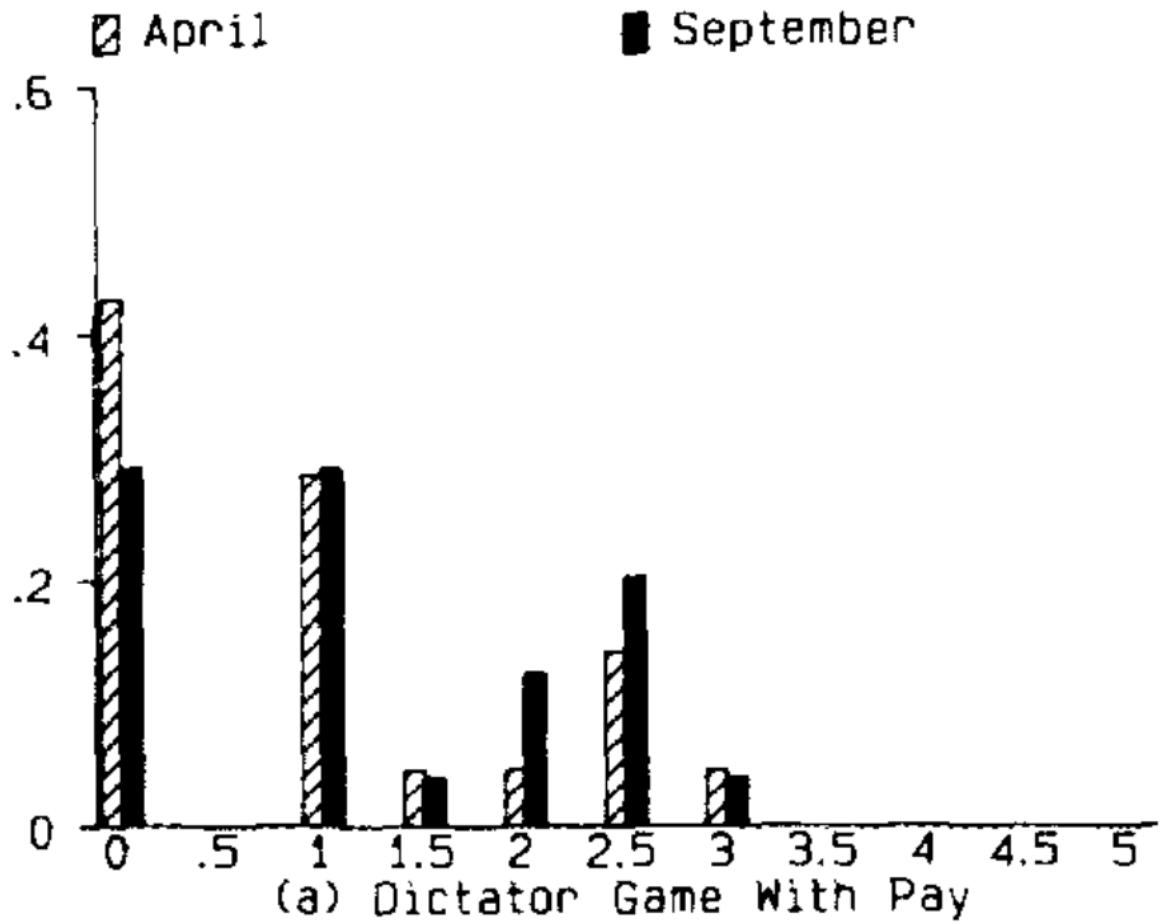


Evidence

The Dictator Game

- Forsythe et al (1994)
- 48 students divided into pairs
- Each pair has one dictator and one recipient
- Dictator divide \$5 between themselves and their partner (recipient)
- This is the origin of the *dictator game*
- Note the budget set: $m = 5$, $p_1 = p_2 = 1$
- Predictions?
  - If people are totally selfish, dictators should keep everything

Forsythe et al (1994): Offers by Dictators



Dictator Game: Generalized Patterns

- Across numerous studies and populations, several patterns appear regularly in dictator games:
  - A minority of subjects are purely selfish
  - Offers between 0% and 30% of pie are common
  - Spike at 50% of pie
  - Rare to see allocations just above or below 50%
  - Offers significantly beyond 50% are essentially non-existent

Wanting to Appear Generous

- One potential confound with the dictator game design: experimenter can see which how much each dictator has given (if anything)
- Dictators may not actually be altruistic when completely anonymous, but want other people (including researcher) to think they are altruistic
- So how do we design an experiment where dictators are assured complete anonymity?

Double-Blind Dictator Experiment

- Run by Hoffman, McCabe, and Smith (1996)
- Ran sessions with 28 subjects
  - 14 proposers in room A
  - 14 receivers in room B
- 14 envelopes in room A
  - 12 have 10 $1 bills and 10 pieces of paper similar in size to bill
  - 2 have just 20 pieces of paper
- Dictators are instructed to take an envelope, and leave just 10 items in it
  - Can be any combination of paper and dollar bills
- Envelopes are put in a box
- Experimenter comes in, takes box to other room, and hands out envelopes to the 14 receivers

Double-Blind Dictator Experiment: Results

- For reference: ran standard dictator game on same population without double-blind precautions
  - Result: 40% of dictators pass no money to receiver
- Result in double-blind version?
  - 62% of dictators passed no money to reciever
  - So sizable fraction of subjects seem to be motivated by *image concerns*
- Experimental design question: What was the point of the 2 envelopes with only paper in them?

Generalizing the Dictator Game

- Very difficult to estimate preferences from just one decision
- We need to vary budget and prices to be able to learn about subject's utility functions
- Andreoni and Miller (2002) introduce the *generalized dictator game*
  - Now the dictator divides a fixed number of tokens
  - Number of tokens varies between rounds
  - Value of tokens to dictator and recipient also varies between rounds

Andreoni and Miller: Budget Sets

TABLE I

ALLOCATION CHOICES

Budget	Token Endowment	Hold Value	Pass Value	Relative Price of Giving	Average Tokens Passed
1	40	3	1	3	8.0
2	40	1	3	0.33	12.8
3	60	2	1	2	12.7
4	60	1	2	0.5	19.4
5	75	2	1	2	15.5
6	75	1	2	0.5	22.7
7	60	1	1	1	14.6
8	100	1	1	1	23.0
9[a]	80	1	1	1	13.5
10[a]	40	4	1	4	3.4
11[a]	40	1	4	0.25	14.8

[a] Were only used in session 5, others used in all sessions.

Rationality: The Weak Axiom

- Before we try to say which utility function people are maximizing, we must ask: "Is there any possible utility function at all that could explain these choices?"
- Suppose we observed X chosen over (ie *revealed preferred to*) Y from one budget set and Y chosen over X from another budget set
- Implies $X \succ Y$ and $Y \succ X$, a contradiction

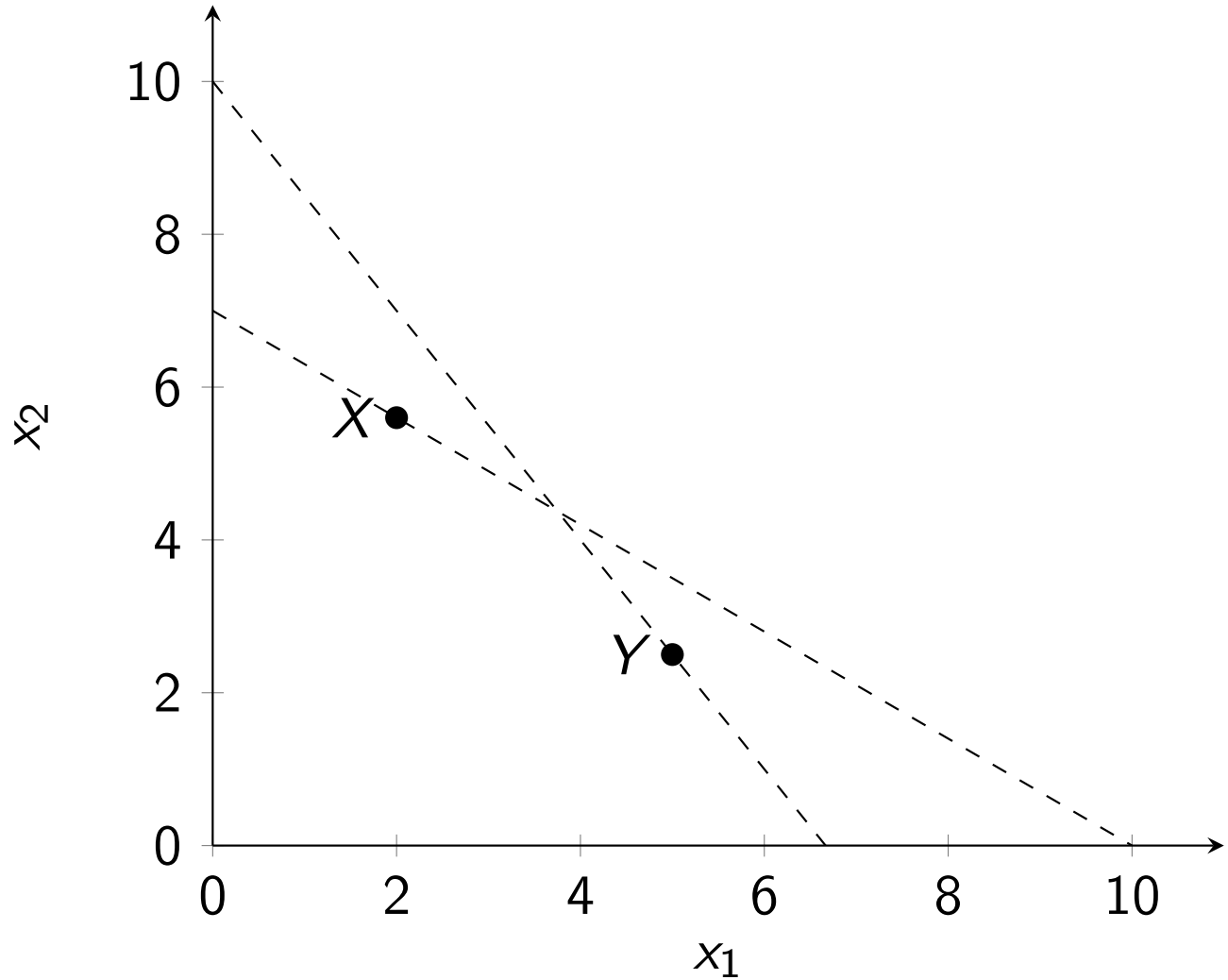
Definition

The *Weak Axiom of Revealed Preference (WARP)* states that if X is chosen over Y, then we cannot have Y chosen over X.

Theorem

If WARP is violated, the observed behavior is not consistent with maximizing some utility function.

Visualizing WARP Violations



Rationality: The Generalized Axiom

- The weak axiom works only one way: If we have a violation, then consumer is not maximizing a utility function
  - But it we don't find a violation, we can't be sure if consumer is maximizing
- Additionally, it says nothing about cycles of inconsistencies
- Luckily we have another condition that addresses both of these issues

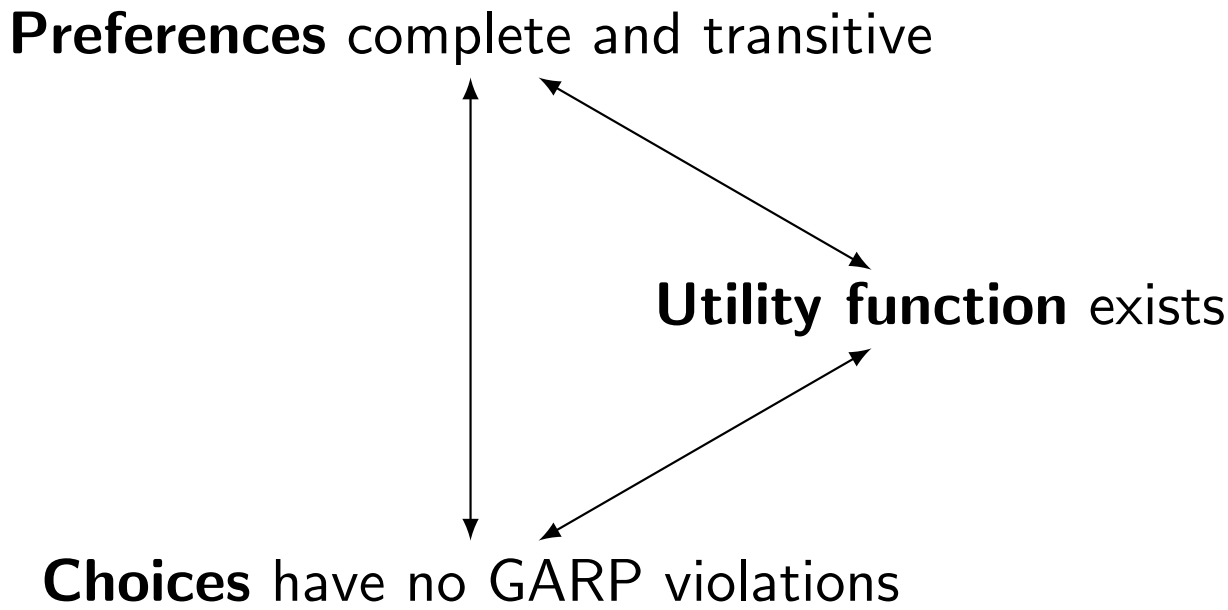
Definition

The *Generalized Axiom of Revealed Preference (GARP)* states that if X is revealed preferred (directly or indirectly) to Y, then Y cannot be strictly revealed preferred to X (directly or indirectly).

Theorem (Arfriat, 1967)

For linear budget constraints, the observed behavior is consistent with maximizing some utility function if and only iff the choices satisfy GARP.

Rationality: Three Equivalent Definitions



- Rationality allows for many non-classical behaviors, eg:
  - Social preferences
  - Time inconsistency
  - Non-EU risk preferences

Andreoni and Miller: Results

- High degree of rationality
  - 90% subjects satisfy GARP exactly
  - Most of the remaining 10% only slightly deviated from GARP
  - Conclusion: 98% of subjects made choices that are consistent or nearly consistent with some utility function
- Variety of utility functions present in the population
  - Now that we know subjects are optimizing a utility function, what is that function?
  - Selfish: 23% of subjects kept all their tokens
  - Utilitarian: 6% of subjects gave their tokens to the person (themselves or recipient) with higher conversion rate of tokens to dollars
  - Rawlsian: 14% of subjects always split tokens equally